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(72) Applicant: Fu Burg Industrial Co. Ltd.  
No. 30-3 Jen Ai Road, Sec. 3, Taipei, Taiwan

(73) Inventor: Shih-Chiang Lin  
1-97-27 Xinsheng S. Rd., Taipei, Taiwan

(74) Attorney: Tamotsu AOYAMA (and one other)

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(54) Title of the Invention: Flat-type and Pants-type Disposable Diaper

(57) Abstract

[Object]

When extended, the diaper becomes a flat-type and when folded and fastened, it becomes a pants-type.

[Result]

An elongate flat main body 2 having a liquid permeable top sheet 22 and a liquid impermeable back sheet 21 is provided with a pair of right and left leg peripheral portions 203 on central portions along the longitudinal direction on both right and left sides and both upper and lower sides are defined as front and back waist portions 201, 202, and a rectangular central portion over the front and back waist portions and a crotch portion is defined as a skin-facing portion 206. An absorbent 23 is buried in the skin-facing portion between the top and back sheets and planar elastic members are buried in both right and left outer sides at least from the back waist portion to the crotch portion of the skin-facing portion. Elongate elastic members 252 are buried to at least a portion along the edge of the skin-facing portion of at least the

back waist portion of the front and back waist portions, and further, one or more of securing members 24 are protruded outwardly from both right and left side edges of the back waist portion.

[Scope of the Utility Model Claims]

[Claim 1]

A disposable diaper for both flat-type and pants-type diapers comprising an elongate flat main body having a liquid permeable top sheet, a liquid impermeable back sheet, in which central portions of the flat main body are cut along the longitudinal direction on both right and left sides to form a pair of right and left leg peripheral portions, a portion between the leg peripheral portions is defined as a crotch portion, both upper and lower sides perpendicular to the longitudinal direction are defined as front and back waist portions, and a rectangular central portion over the front and back waist portions and a crotch portion is defined as a skin-facing portion, an absorbent is buried in the skin-facing portion and planar elastic members are buried in both right and left outer sides at least from the back waist portion to the crotch portion between the top sheet and the back sheet, elongate elastic members are buried to at least a portion along the edge of the skin-facing portion of at least the back waist portion of the front and back waist portions, and further, one or more of securing members are protruded outwardly from both right and left side edges of the back waist portion.

[Claim 2]

A disposable diaper for both flat-type and pants-type diapers as defined in claim 1, which uses elongate elastic members having one-dimensional tensile elasticity and an allowable tensile length of at least 3 times the ordinary length.

[Claim 3]

A disposable diaper for both flat-type and pants-type diapers as defined in claim 1, which uses planar elastic members having two-dimensional tensile elasticity.

[Claim 4]

A disposable diaper for both flat-type and pants-type diapers as defined in claim 1, wherein the vertical width of the securing member occupies at least  $\frac{2}{3}$  of the vertical width of the back waist portion.

[Claim 5]

A disposable diaper for both flat-type and pants-type diapers as defined in claim 1, wherein the planar elastic member extends from the back waist portion to the front waist portion by way of the crotch portion.

[Claim 6]

A disposable diaper for both flat-type and pants-type diapers as defined in claim 1, wherein the elongate elastic member is buried also to at least a portion along the edge of the skin-facing portion of the front waist portion.

[Brief Description of the Drawings]

FIG. 1 is a plan view of a conventional flat-type diaper.

FIG. 2 is a perspective view of a conventional pants-type diaper.

FIG. 3 is a plan view showing the extended state of a first embodiment of a flat-type or pants-type disposable diaper according to the present invention.

FIG. 4 is a sectional view along the line A – A in FIG. 3.

FIG. 5 is a perspective view of the attached state of a pants-type diaper according to the embodiment shown in FIG. 3.

FIG. 6 is a plan view showing the extended state of a second embodiment.

FIG. 7 is a plan view showing the extended state of a third embodiment.

FIG. 8 is a plan view showing the extended state of a fourth embodiment.

FIG. 9 is a plan view showing the extended state of a fifth embodiment.

FIG. 10 is a plan view showing the extended state of a sixth embodiment.

FIG. 11 is a plan view showing the extended state of a seventh embodiment.

FIG. 12 is a plan view showing the extended state of an eighth embodiment.

FIG. 13 is a plan view showing the extended state of a ninth embodiment.

FIG. 14 is a plan view showing the extended state of a tenth embodiment.

[Description of the Reference Numerals]

- 2 FLAT MAIN BODY
- 21 BACK SHEET
- 22 TOP SHEET
- 23 ABSORBENT
- 24 SECURING MEMBER
- 201 FRONT WAIST PORTION
- 202 BACK WAIST PORTION
- 203 LEG PERIPHERAL PORTION
- 204 CROTCH PORTION
- 206 SKIN-FACING PORTION
- 231 LINING LAYER FOR ABSORBENT
- 232 ABSORBENT CORE MEMBER
- 251 PLANAR ELASTIC MEMBER
- 252 ELONGATE ELASTIC MEMBER

[Detailed Description of the Invention]

[0001]

[Field of Industrial Use]

The present invention relates to a pants-type or flat-type disposable diaper for use with infants, the elderly or the incontinent.

[0002]

[Conventional Technology]

As shown in FIG. 1, conventional examples of this type of disposable diaper are almost always a so-called flat disposable diaper in which a flat main body 10 is applied to a wearer and then a tape fastener 102 is attached. The flat-type disposable diaper as shown in the figure forms an elongate central portion extending perpendicular with respect to the back face (surface facing the skin of a user) of the elongate flat main body 10 as a skin-facing portion 104, both edge portions of the flat main body 10 are formed as waist portions 101, 101. Both edge central portions along the longitudinal direction of the skin-facing portion 104 of the flat main body 10 are cut in a curving shape to form a pair of right and left leg peripheral portions 105, 105 and respective elastic members 103, 103 are buried and fixed along the longitudinal direction between the skin-facing portion 104 and the leg peripheral portions 105, 105.

[0003]

Recently as shown in FIG. 2, a so-called pants-type diaper has been proposed with respect to the flat-type disposable diaper. In this type of pants-type diaper side portions 116, 117 are pre-sewn and bonded without using a tape fastener and is provided respectively with elastic members on the front and back waist portions 111, 111, the whole periphery of the leg peripheral portions 115, 115 and the side portions 116, 117.

Since this type of pants-type diaper can be simply attached in the same manner as normal underwear, it is of course used with infants, and older children as toilet training pants and as pants for the incontinent and the elderly.

[0004]

[Problem to be Solved by the Invention]

This type of conventional disposable diaper has respective advantages and disadvantages when in the flat-type or pants-type form. For example, when in pants form, there are disadvantages associated with the checking or confirmation of the

presence or absence of excreta. When in flat form, since a tape-shaped small fastener 102, 102 is used when attaching and fixing with respect to the body, the attached state is not stable. Furthermore, it is obviously difficult to attach a flat-type when the user is standing and, on the other hand, when lying down, there are more disadvantages associated with the flat-type form than with the pants-type form.

[0005]

Furthermore, these two types of disposable diaper are only provided with local elastic portions and therefore the strength of attachment when wearing is poor and the diaper tends to become loose, shift and detach. In other words, since the flat-type form is not provided elastic members in the waist portions 101, 101, almost the entire weight of the diaper and the excreta retained therein is applied on the tape fastener 102, 102, the tape fastener gradually shifts and the entire diaper becomes loose and moves which finally results in the possibility of detachment.

[0006]

The present invention is proposed with respect to the above problems and has the object of providing a flat-type and a pants-type diaper which, when extended, becomes a flat-type and, when folded and fastened, becomes a pants-type and which when attached provides a tight fit.

[0007]

In order to achieve the above object, the present invention in claim 1 proposes a disposable diaper for both flat-type and pants-type diapers comprising an elongate flat main body having a liquid permeable top sheet, a liquid impermeable back sheet, in which central portions of the flat main body are cut along the longitudinal direction on both right and left sides to form a pair of right and left leg peripheral portions. A portion between the leg peripheral portions is defined as a crotch portion. Both upper and lower sides perpendicular to the longitudinal direction are defined as front and back waist portions, and a rectangular central portion over the front and back waist portions and a crotch portion is defined as a skin-facing portion. An absorbent is buried in the skin-facing portion and planar elastic members are buried in both right and left outer sides at least from the back waist portion to the crotch portion between the top sheet and the back sheet. Elongate elastic members are buried to at least a portion along the edge of the skin-facing portion of at least the back waist portion of the front and back waist portions, and further, one or more of

securing members are protruded outwardly from both right and left side edges of the back waist portion.

[0008]

It is preferred that elongate elastic members are used having one-dimensional tensile elasticity and an allowable tensile length of at least 3 times the ordinary length. (claim 2)

[0009]

It is preferred that planar elastic members are used having two-dimensional tensile elasticity. (claim 3)

[0010]

It is preferred that the vertical width of the securing member occupies at least 2/3 of the vertical width of the back waist portion. (claim 4) A single securing member may project from the right and left edges of the back waist portion or two may project.

[0011]

It is preferred that the planar elastic member extends from the back waist portion to the front waist portion by way of the crotch portion. (claim 5)

[0012]

It is preferred that the elongate elastic member is buried also to at least a portion along the edge of the skin-facing portion of the front waist portion. (claim 6)

[0013]

The disposable diaper according to the present invention can be used as a flat-type or pants-type when worn and facilitates use adapted to the posture of a wearer. Furthermore since respective planar elastic members covering at least the back waist portion and the crotch portion are buried on both peripheries of the skin-facing portion along the longitudinal direction of the flat main body, a tight fit is enabled when worn without loosening or shift. In particular, when an elastic member having two-dimensional tensile elasticity is used, strength of attachment is good and the weight of the diaper and the excreta retained therein is divided which enables a reduction in the weight applied to the attaching member.

[0014]

[Embodiments]

The present invention as shown in FIG. 3 to FIG. 5 will be described below based on the embodiments. Note, however the present invention is not limited to such embodiments.

[0015]

Firstly FIG. 3 to FIG. 5 show a first embodiment of a pants-type and flat-type disposable diaper according to the present invention. The disposable diaper according to the present invention is formed from an elongate flat main body 2. The flat main body 2 as shown in FIG. 4 is formed overall from a liquid impermeable top sheet 22 and a liquid permeable back sheet 21. An absorbent 23 is buried in a skin-facing portion 206 described hereafter between the sheets 22 and 21. The absorbent 23 is formed from a lining layer 231 and an absorbent core member 232. Note, the top surface is the surface which is the outer surface when worn and the back surface is the surface which is the inner surface in contact with the skin when worn.

[0016]

A pair of right and left leg peripheral portions 203 is provided on a central portion of both side edges along the longitudinal direction of the elongate flat main body 2 to form a curved portion opening outwardly in a predetermined shape. The section between the leg peripheral portions 203 is defined as a crotch portion 204. Furthermore both side edges in a direction perpendicular to the longitudinal direction of the flat main body 2 form front and back waist portions 201, 202. The elongate central portion traversing these front and back waist portions 201, 202 and the crotch portion 204 forms the skin-facing portion 206.

[0017]

Elongate elastic members 252, 252 having at least having one-dimensional tensile elasticity and an allowable tensile length of at least 3 times the ordinary length are buried in a position corresponding to the vertical end edges of the skin-facing portion 206 of the front and back waist portions 201, 202.

[0018]

Two tape fasteners are mounted as respective securing portions 24 extending outwardly from the right and left edges of the back waist portion 202 in an upper position in FIG. 3. The total L2 ( $L2 = L1 + L1$ ) of the width (vertical dimension in FIG. 3) L1 of these two securing members 24 is set so that L1 is at least 2/3 of the



vertical dimension L3 of the back waist portion 202 in order to improve stability when attached.

[0019]

Planar elastic members 251, 251 having a two-dimensional tensile elasticity are buried from the back waist portion 202 through the crotch portion 204 to the front waist portion 201 on the right and left outer side of the skin-facing portion 206. The planar elastic members 251, 251 both open outwardly with a curved shape forming leg peripheral portions 203 in an approximately central portion. Thus the section making contact with the leg peripheral portions 203 when worn can impart a soft sensation to a wearer.

[0020]

When a disposable diaper according to a first embodiment is used in a flat state as shown in FIG. 3, the upper half of the skin-facing portion 206 makes contact from the back hips to the buttocks of a user and the lower half is curved through the crotch to the stomach of a user. Then securing portions 24, 24 in the back waist portion are superimposed, attached and fixed to the top surface of the front waist portion 201.

[0021]

However, when attached in a pants-type form, before attachment, firstly the diaper is folded into two and the whole diaper is firmly superimposed attached and fixed from the securing portions 24, 24 which have a large attachment surface area to form a pants form as shown in FIG. 5. In this state, attachment is possible in the same manner as ordinary underwear.

[0022]

A pants-type and flat-type disposable diaper according to the present invention is not limited to the first embodiment and an elongate elastic member may be buried with respect to least the back waist portion of the front and back waist portion and in at least a section along the edge of the skin-facing portion of the back waist portion. Furthermore at least one attachment member may be provided respectively to extend outwardly from the right and left sides of the back waist portion, and respective planar elastic members may be buried in the length including at least the back waist portion and the crotch portion on the right and left outer side of the skin-facing portion along a longitudinal direction. Thus the embodiments respectively shown in FIG. 6 to FIG. 12 are enabled.

[0023]

A second embodiment shown in FIG. 6 has a different cut shape to that of the first embodiment formed in a central portion of the flat main body 2 for providing the leg peripheral portions 203. In other words, although a cut in the shape of a circular arc is provided in the first embodiment to form the leg peripheral portions 203, the leg peripheral portions 203 in the second embodiment are formed by providing a trapezoidal-shaped cut. Note, the disposable diaper for each embodiment shown in FIG. 7 to FIG. 14 hereafter forms the leg peripheral portions 203 as a trapezoidal cut. However in each of these embodiments, needless to say, the leg peripheral portions may be formed by providing a circular-arc shaped cut in the same manner as the first embodiment.

[0024]

A third embodiment shown in FIG. 7 differs from the second embodiment with respect to the shape of the securing portion 24. In other words, in the first and second embodiments, although two tape fasteners 24 project respectively from the right and left ends of the back waist portion 202, in the third embodiment, a single securing portion 24, 24 having the same width as the width L3 of the back waist 202 projects from the entire length of the right and left ends of the back waist portion 202.

[0025]

A fourth embodiment as shown in FIG. 8 respectively buries the elastic members 252, 252 provided in the end edge of the front and back waist portion 201, 202 in the second embodiment across the entire right and left length of the back waist portion 202. Furthermore securing members 24 in the same manner as the first embodiment are formed by mounting two tape fasteners on the right and left edges of the back waist portion 202.

[0026]

A fifth embodiment as shown in FIG. 9 differs from the fourth embodiment only with respect to point that the right and left securing members 24 are formed from a single securing member 24 having a width L3 equal to that of the third embodiment. The elastic members 252, 252 buried in the front and back waist portion 201, 202 are provided across the entire right and left length of each waist portion.

[0027]

A sixth embodiment as shown in FIG. 10 provides the elastic members 252, 252 buried in the front and back waist portion 201, 202 only in a section

corresponding to the skin-facing portion 206. Furthermore a portion corresponding to the leg peripheral sections 203, 203 is not formed in a curved shape in the planar elastic members 251, 251 on the right and left sides of the skin-facing portion 206 but rather is disposed linearly between both ends of the front and back waist portions 201, 202.

[0028]

A seventh embodiment as shown in FIG. 11 differs from the sixth embodiment only with respect to point that the elastic members 252, 252 buried in the front and back waist portion 201, 202 are disposed across the entire right and left length of the waist portion.

[0029]

An eighth embodiment as shown in FIG. 12 differs from the seventh embodiment only with respect to point that the securing members 24, 24 mounted on the right and left sides of the back waist portion 202 are formed by mounting two tape fasteners on both right and left edges of the back waist portion 202.

[0030]

A ninth embodiment as shown in FIG. 13 disposes the planar elastic members 251 with a large surface area in the right and left sides of the back waist portion 202 and disposes the members 251 in a narrow width along the right and left edges of the crotch portion 204 and buries the members in a non-continuous manner. In other words, a pair of rectangular elastic members 251a is buried across the entire right and left width of the back waist portion 202 and a pair of right and left narrow-width elastic members 251b is buried along the leg peripheral portions 203 which are cut in a trapezoidal shape.

[0031]

A tenth embodiment as shown in FIG. 14 differs from the ninth embodiment only with respect to point that the large surface area elastic members 251c, 251c are mounted on the right and left sides of the front waist portion 201.

[0032]

[Effect of the Invention]

As clearly shown by the above description, since a disposable diaper according to claim 1 of the present invention provides at least one securing member extending outwardly from the right and left edges of the back waist portion of the diaper, the securing member enables attachment and fixing in a stable manner when

attaching the entire diaper. Furthermore it is possible to use as a flat-type diaper while leaving in an extended state and can be used as a pants-type diaper by folding before attachment and attaching with the securing member. Furthermore since planar elastic members are buried across at least the entire length including the back waist portion and the crotch portion, a tight fit is enabled when worn and the weight of the diaper and the excreta therein is distributed which decreases the load on the securing member.

[0033]

Since an elongate elastic member provided in the front and back waist portions of a disposable diaper according to claim 2 has one-dimensional tensile elasticity and an allowable tensile length of at least 3 times the ordinary length, the effect of distributing the weight above is further improved.

[0034]

Since a planar elastic member of a disposable diaper according to claim 3 has two-dimensional tensile elasticity, there is a large effect creating a tight fit when worn.

[0035]

Since a securing member of a disposable diaper according to claim 4 is mounted with a width occupying at least  $\frac{2}{3}$  of the vertical width of the back waist portion, stability when attached is good and shift or slip when worn does not occur.

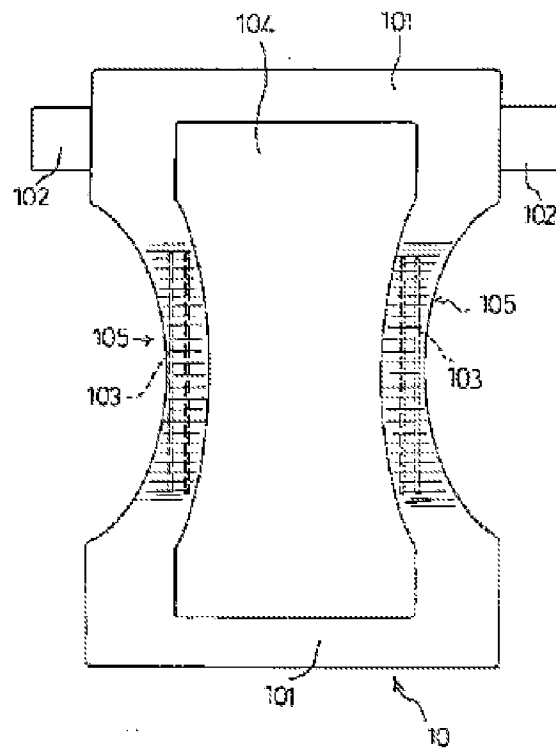
[0036]

Since a planar elastic member of a disposable diaper according to claim 5 extends from the back waist portion to the crotch portion and is disposed across the entire width from one end to the other end of the entire diaper and is not disposed locally, the entire diaper fits well and slip or shift due to excreta can be more effectively prevented.

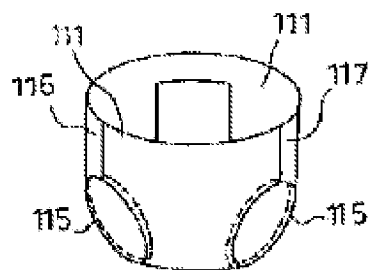
[0037]

Since a planar elastic member of a disposable diaper according to claim 6 is mounted also on the right and left sides of the skin-facing portion of the front waist portion, the fitting strength about the waist is increased.

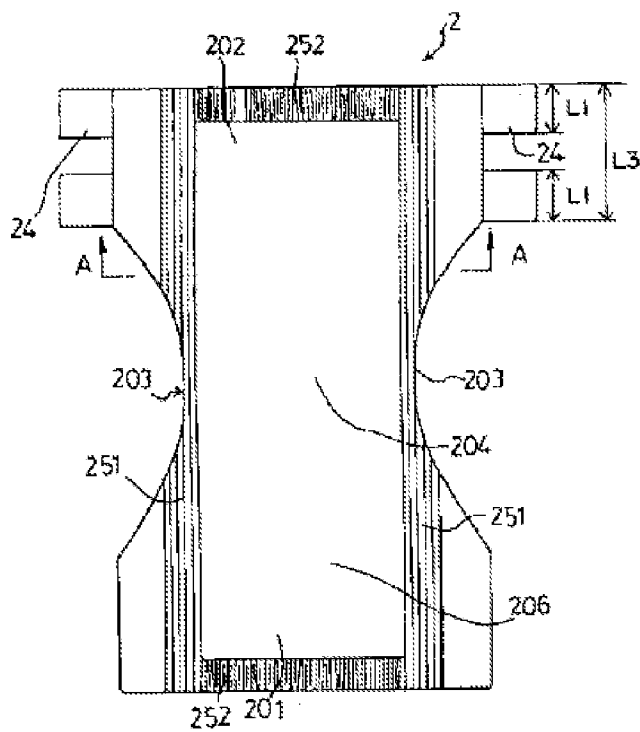
[FIG. 1]



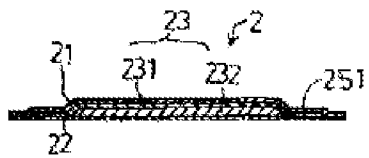
[FIG. 2]



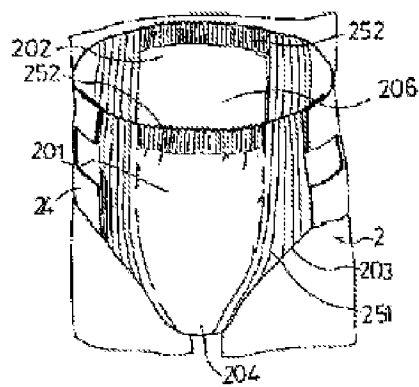
[FIG. 3]



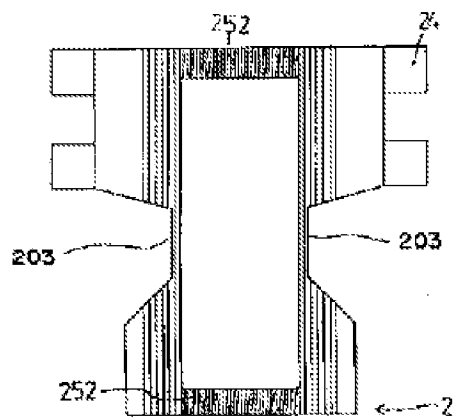
[FIG. 4]



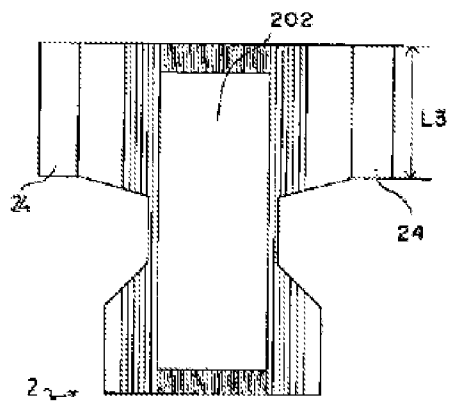
[FIG. 5]



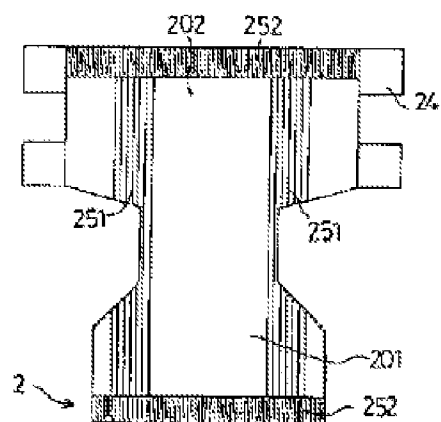
[FIG. 6]



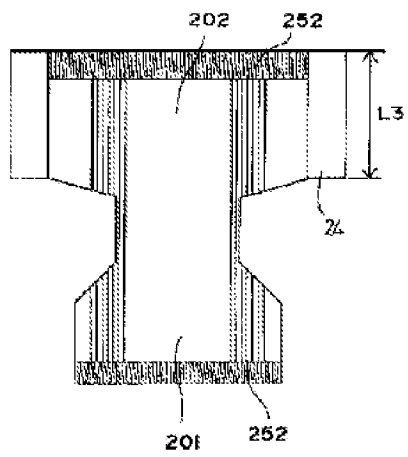
[FIG. 7]



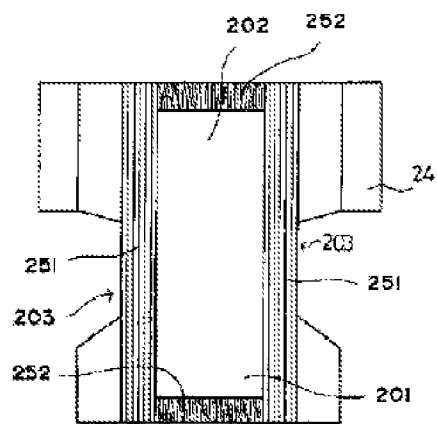
[FIG. 8]



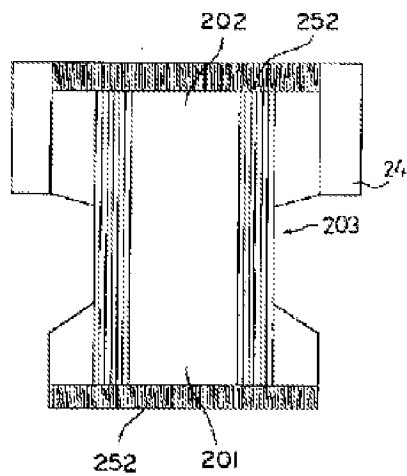
[FIG. 9]



[FIG. 10]

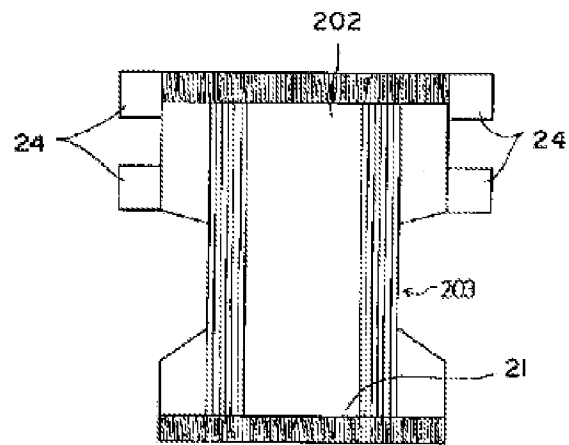


[FIG. 11]

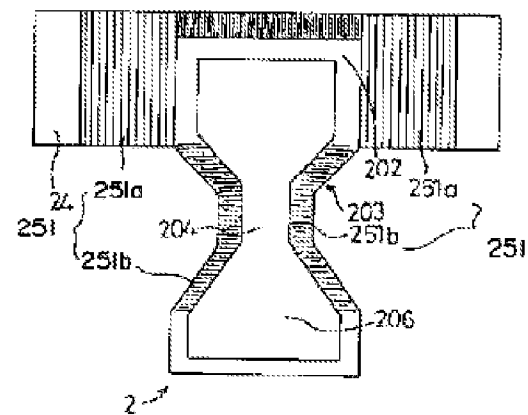




[FIG. 12]



[FIG. 13]



[FIG. 14]

